

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements relating to Radial Needle-type Bearings

We, DAIMLER-BENZ AKTIENGESELLSCHAFT, of Stuttgart-Untertürkheim, Germany, a Company organised under the laws of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns improvements relating to radial needle-type bearings for wheels, particularly but not exclusively planet wheels of motor-vehicle change-speed gearing, in which the needles are disposed without a cage between the wheel and a pivot and in which thrust washers are provided.

In such a bearing, the washers transmit axial forces, which are produced under certain conditions of loading by crosswise setting of needles caused by radial play. The thrust surfaces are thus destroyed by erosion or "fretting". The present invention seeks to prevent such destruction of the washers.

According to the invention, in a radial bearing having bearing needles disposed without a cage between the wheel and a pivot, at least two thrust washers of different degrees of hardness are provided at each side face of the wheel, the harder washers, located against the said faces and engageable by the ends of the needles having a degree of hardness co-ordinated with that of the needles.

By the use of washers made of soft bearing metal, which facilitate sliding movement, erosion is avoided, while the harder washers, advantageously made of spring steel, prevent the needle ends from penetrating into the soft bearing metal.

Preferably, the washers are disposed on the pivot rotatably and with axial play, so that the relative speed of surfaces sliding on each other is reduced and the wheel is

allowed a certain freedom of axial movement.

One embodiment of the invention as applied, for example, to the mounting of a planet wheel of a motor-vehicle change-speed gearing will now be more fully described with reference to the accompany drawing, in which:—

Figure 1 is a radial section through the planet carrier and

Figure 2 a detail view of a portion A of Figure 1 to a larger scale.

The planet wheel 1 is mounted with axial play on the planet carrier 4 by bearing needles 2 disposed without a cage on a pivot 3 which is mounted in bores 5, 6 in the carrier and is secured by upsetting its ends so that they are expanded in the bores. Soft thrust washers 7, for example of bearing metal, are mounted rotatably on the pivot 3 between the carrier 4 and wheel 1. Harder thrust washers 8, for example of spring steel, are provided between the washers 7 and wheel 1. The washers 8 can be rotated by the wheel 1 due to the frictional forces between their adjacent end faces. The degree of hardness of the washers 8 is co-ordinated with that of the needles 2 in such a manner as to avoid excessive wear.

This arrangement of washers of different materials and degrees of hardness in a radial needle-type bearing affords a simple and reliable means of preventing destruction of the washers by erosion.

WHAT WE CLAIM IS:—

1. A radial bearing for a wheel having bearing needles disposed without a cage between the wheel and a pivot, wherein at least two thrust washers of different degrees of hardness are provided at each side face of the wheel, the harder washers, located against the said faces and engageable by the

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ends of the needles, having a degree of hardness co-ordinated with that of the needles.

5 2. A bearing according to claim 1, wherein bearing metal is used for the washers having the lower degree of hardness.

3. A bearing according to claim 1 or 2, wherein spring steel is used for the washers having the higher degree of hardness.

10 4. A bearing according to claim 1, 2 or 3, wherein the washers are disposed on the pivot rotatably and with axial play.

5. A needle bearing according to any one of claims 1 to 4, being a bearing for a planet wheel of a motor-vehicle change-speed gear- 15 ing.

6. A needle bearing substantially as hereinbefore described with reference to the accompanying drawing.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the ~~Original on a~~ reduced scale*

Fig.1

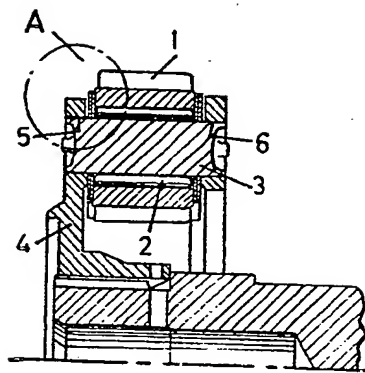


Fig.2

